

WHAT IS CLAIMED IS:

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1. A nitride semiconductor substrate comprising:
a group III nitride semiconductor substrate;
a mask formed over the group III nitride semiconductor substrate; and
- 5 a semiconductor multilayer film formed above the mask;
the mask having a polycrystalline material deposited on the surface thereof.
2. The nitride semiconductor substrate according to Claim 1, wherein the polycrystalline material is formed from a material containing aluminum and nitrogen as essential elements.
3. The nitride semiconductor substrate according to Claim 1, wherein voids are formed on the surface of the mask having the polycrystalline material.
4. The nitride semiconductor substrate according to Claim 1, wherein the mask is provided on the surface of the group III nitride semiconductor substrate.
5. The nitride semiconductor substrate according to Claim 1, wherein the group III nitride semiconductor substrate has a dislocation density in the vicinity of the surface thereof of $1 \times 10^7/\text{cm}^2$ or less.

6. A nitride semiconductor device comprising:
a group III nitride semiconductor substrate;
a mask formed over the group III nitride semiconductor substrate; and
- 5 a semiconductor multilayer film formed above the mask, the semiconductor multilayer film including an active layer;
wherein the mask has a polycrystalline material deposited on the surface thereof.
7. The nitride semiconductor device according to Claim 6, wherein the polycrystalline material is formed from a material containing aluminum and nitrogen as essential elements.
8. The nitride semiconductor device according to Claim 6, wherein voids are formed on the surface of the mask having the polycrystalline material.
9. The nitride semiconductor device according to Claim 6, wherein the mask is provided on the surface of the group III nitride semiconductor substrate.
10. The nitride semiconductor device according to Claim 6, wherein the group III nitride semiconductor substrate has a dislocation density in the vicinity of the surface thereof of $1 \times 10^7/\text{cm}^2$ or less.
11. The nitride semiconductor device according to Claim 6, wherein the mask is provided in the vicinity of a device separating plane

of the nitride semiconductor device.

12. A process for producing a nitride semiconductor substrate, the process comprising:

a step of forming a mask above a group III nitride semiconductor substrate;

5 a step of depositing a polycrystalline material on the surface of the mask; and

a step of forming a semiconductor multilayer film above the mask, the semiconductor multilayer film including an active layer.

13. The process for producing a nitride semiconductor substrate according to Claim 12, wherein the step of depositing the polycrystalline material on the surface of the mask includes a step of depositing the polycrystalline material after bringing the

5 surface of the mask into contact with an acid.

14. The process for producing a nitride semiconductor substrate according to Claim 12, wherein in the step of depositing the polycrystalline material on the surface of the mask voids are formed on the surface of the mask.

15. The process for producing a nitride semiconductor substrate according to Claim 12, wherein the mask is provided on the surface of the group III nitride semiconductor substrate.

16. The process for producing a nitride semiconductor substrate

according to Claim 12, wherein the group III nitride semiconductor substrate has a dislocation density in the vicinity of the surface thereof of $1 \times 10^7/\text{cm}^2$ or less.

17. A process for producing a nitride semiconductor device, the process comprising:

a step of forming a mask above a group III nitride semiconductor substrate;

5 a step of depositing a polycrystalline material on the surface of the mask; and

a step of forming a semiconductor multilayer film above the mask, the semiconductor multilayer film including an active layer.

18. The process for producing a nitride semiconductor device according to Claim 17, wherein the step of depositing the polycrystalline material on the surface of the mask includes a step of depositing the polycrystalline material after bringing the
5 surface of the mask into contact with an acid.

19. The process for producing a nitride semiconductor device according to Claim 17, wherein in the step of depositing the polycrystalline material on the surface of the mask voids are formed on the surface of the mask.

20. The process for producing a nitride semiconductor device according to Claim 17, wherein the mask is provided on the surface of the group III nitride semiconductor substrate.

21. The process for producing a nitride semiconductor substrate according to Claim 17, wherein the group III nitride semiconductor substrate has a dislocation density in the vicinity of the surface thereof of $1 \times 10^7/\text{cm}^2$ or less.